**Changing Landscapes**
**Sandstone Quarry**
**Field Program**
**by Sky McClain**
**revised 9/6/01**

**Grade:** **Fifth**

**Subject:** **Earth Science**

**Objectives:** **The students will be able to (a) compare and contrast different types of maps (b) locate and compare two or more landform features.**

**Curriculum:** **Students will investigate and describe:**
**(5) 3.3 the surface of the Earth, has a varied topography.**
**(5) 3.4 how soil is made of many different biological and mineral materials and varies from place to place.**
**(5)3.5 identify compass directions on a map**
**(5)3.8 explain the Earth surface changes due to a variety of factors and others happen very slowly.**
**(5)4.1 interrelationships and interdependence of organisms with each other and with the non-living parts of their habitats.**

**Materials:**

- **topographic maps**
- **road maps**
- **national forest map**
- **calico tanks map**

**Background:** **An ability to read topographic maps will help students understand land use, as well as flooding problems and identify geological features such as mountains and stream systems.**

**In Earth Science topographical maps are especially valuable in identifying hills, washes, plateaus, glacial features and plains because of their ability to depict three-dimensional features.**

**The natural forces at work on Earth wind, water, earthquakes change the Earth's surface- erosion, deposition, creation of new land, faulting, etc. These forces create landforms such as hills, cliffs, stream, valleys, mountains, washes, basins, etc.**

**Landforms at Red Rock Canyon were formed by long ago geological changes. Today landforms continue to change through physial and mechanical interventions, as well as land movement.**

**Vocabulary:** **<u>contour line</u>- a line on a topographical map which connects points of equal elevation**

**<u>landform</u>- a natural geographic feature such as mountains, valleys, or streams**

**Pre-visit: Have the class brainstorm as many landforms as they can think of. Ask if any of these can be found around or near Las Vegas.**

**Stop One**
**Sandstone Quarry parking lot**
**Look out over valley and discuss briefly landforms students can see rising from valley floor..**
**Distribute three or four different types of maps Maps have symbols that represent features. Have students study the maps. Ask if they can identify directions from indicators on the maps. Introduce compass use and locate direction of Las Vegas, Visitor Center, and Turtle Peak.**
**Fist Activity**
**Have each student make a fist.**
**The knuckles represent the Ridgeline, one knuckle represents a Hilltop**
**Between the two knuckles is a Saddle**
**A Spur is the length of a folded finger from knuckle to fold, A Draw is between two folded fingers**
**A Valley is found between the bottoms of the folded fingers**
**A Cliff is at the back of the hand behind the knuckles.**

**Stop Two - Quarry**
**Discuss some of the human impact the students see on the sandstone formations. Mining activity and today's climbers have changed the look of the formations. Examine large blocks of sandstone and their past and present use.**

**Stop Three – Wash**
**Discuss what a wash is. Describe the colors, textures, plant life found in and around the wash. Erosion of the sides – effect weather has on a wash - gravel and sand.**

**Stop Four - Agave Roasting Pit**
**Discuss human use of limestone rocks. Why limestone and where did it come from. Discuss Turtle Peak formation - direction it lies from the pit, rock composition of landmark.**

**Stop Five - Slot Canyon/'Sandstone Formations**
**Discuss cracks, layering, faults, ledge, cross-bedding, fracturing, formations. Compare observations with check-list.**
**How would your knowledge of landforms help you with your decisions to find food, water, shelter?**

**Conclusion: Maps are essential to determining directions, locations of landforms, and geological features. Once a landform is located by observing it up close you can determine its geological**
**history as well as any uses humans may have derived from it. Each landform varies from the others in unique ways, depending on the mineral composition, amount of precipitation, and the animal / plant activity in the area.**

**Post site activity**
**Discuss topographical maps in depth. Explain that they represent landforms. Lead into "Mapping a Mountain" by talking about contour lines. With a pen, trace around the outside of the largest slice. Then place the next smallest slice inside the tracing they just made, and continue this until an outline of the smallest slice has been traced. To reinforce this concept have the students do "Topo Tattoos." With a felt tip pen have them draw a line around points of equal elevation on their fists starting with their knuckles. Then repeat with points of lower elevation on the fist. Have the students open their fists and they will see a topo map of their hands.**

**Slot Canyon Checklist**

**(Sketch description as you see it in the slot canyon)**

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|---|---|
| **Canyon** | **Deep, steep-sided rocky valley cut by rejuvenation in resistant rock or along a fault.** |
| **Crack** | **A partial split or break.** |
| **Cross-bedding** | **Inclined beds -laid down at an angle to the horizontal bed** |
| **Fault** | **split that forms in stressed rock, particularly near the surface.** |
| **Fracture** | **The manner in which a mineral breaks** |
| **Layering** | **Numerous layers of sediment deposited over time** |

| | |
|---|---|
| **Ledge** | **A narrow shelf projecting from a wall.** |
| **Weathering** | **Changes that take place in minerals and rocks at or near the surface of the earth in response to the atmosphere, to water, and plant/animal activity.** |